

CLAIMS

What is claimed is:

- 5 1. A method for treatment of at least one tissue sample in an automated staining apparatus comprising the steps of:
 - providing at least one slide having a tissue sample;
 - pivoting said at least one slide having said tissue sample to a substantially vertical position;
 - 10 immersing said substantially vertically oriented slide into a fluid containment element; and
 - processing said tissue sample on said substantially vertically oriented slide.
- 15 2. A method according to claim 1 wherein said step of immersing said substantially vertically oriented slide into said fluid containment element comprises the step of immersing said substantially vertically oriented slide into a dip tank.
- 20 3. A method according to claim 1 or 2 wherein said step of providing said at least one slide having said tissue sample comprises the step of providing said at least one slide having said tissue sample in a slide rack.
- 25 4. A method according to claim 1 or 2 wherein said step of providing said at least one slide having said tissue sample comprises the step of providing a plurality of slides in a slide rack.
5. A method according to claim 4 wherein said plurality of slides are individually pivotable.
- 30 6. A method according to claim 1 and further comprising the step of supplying a processing liquid from at least one supply tank in said fluid containment element.

7. A method according to claim 2 and further comprising the step of supplying a processing liquid from at least one supply tank in said dip tank.
8. A method according to claim 1 and further comprising the step of filling and
5 draining said fluid containment element of fluid.
9. A method according to claim 8 and further comprising the step of transferring liquid from a supply tank to a transfer tank to said fluid containment element.
- 10 10. A method according to claim 1, 2, 6 or 9 and further comprising the step of subjecting said immersed slide to a series of fluids which are sequentially filled and drained from said fluid containment element.
11. A method according to claim 1, 2, 6 or 9 and further comprising the step of
15 heating liquid contained in said containment element to a predetermined temperature wherein said predetermined temperature is selected from the temperatures consisting of:
- at least about 95°C; and
 - at least about 120°C.
- 20
12. A method according to claim 1, 2, 6 or 9 wherein said step of immersing said substantially vertically oriented slide into said fluid containment element comprises the step of lowering said at least one slide into said fluid containment element.
- 25 13. A method according to claim 4 wherein said step of immersing said substantially vertically oriented slide into said fluid containment element comprises the step of lowering said slide rack holder into said fluid containment element.
14. A method according to claim 11 wherein said step of immersing said
30 substantially vertically oriented slide into said fluid containment element comprises the step of lowering said at least one slide into said fluid containment element.

15. A method according to claim 1, 2, 6 or 9 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of pretreating said tissue sample on said at least one slide.
- 5 16. A method according to claim 4 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of pretreating said tissue sample on said at least one slide.
- 10 17. A method according to claim 12 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of pretreating said tissue sample on said at least one slide.
- 15 18. A method according to claim 1, 2, 6 or 9 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of processing said tissue sample with a deparaffinization treatment of said tissue sample.
- 20 19. A method according to claim 4 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of processing said tissue sample with a deparaffinization treatment of said tissue sample.
- 20 20. A method according to claim 12 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of processing said tissue sample with a deparaffinization treatment of said tissue sample.
- 25 21. A method according to claim 1, 2, 6 or 9 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of target retrieval processing of said tissue sample.
- 30 22. A method according to claim 4 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of target retrieval processing of said tissue sample.

23. A method according to claim 12 wherein said step of processing said tissue sample on said substantially vertically oriented slide comprises the step of target retrieval processing of said tissue sample.
- 5 24. An automatic stainer apparatus comprising:
at least one tissue sample accommodated on a slide;
at least one reagent;
at least one slide rack configured to accommodate at least one slide;
a slide holder;
10 a fluid containment element;
a vertical slide positioner adapted to pivot said at least one slide in a vertical position; and
a slide immerser element adapted to immerse said at least one slide in said vertical position in fluid of said fluid containment element.
- 15 25. An apparatus according to claim 24 wherein said fluid containment element comprises a dip tank.
26. An apparatus according to claim 24 wherein said at least one reagent comprises
20 reagents arranged in a sequence according to a staining protocol.
27. An apparatus according to claim 24 wherein said slide immerser element comprises a slide immerser element adapted to lower said at least one slide in said vertical position in said fluid containment element.
- 25 28. An apparatus according to claim 24, 26 or 27 wherein said fluid containment element comprises an elongated tank having an upper opening slot.
29. An apparatus according to claim 25 wherein said dip tank comprises an
30 elongated tank having an upper opening slot.

30. An apparatus according to any of claims 24, 26 or 27 wherein said fluid containment element comprises a heating member.
31. An apparatus according to claim 30 wherein said heating member is adapted to heat to an elevated temperature wherein said elevated temperature is selected from the group consisting of:
- at least about 95°C; and
 - at least about 120°C.
32. An apparatus according to claim 24, 26 or 27 and further comprising:
- a pneumatic element adapted to transfer liquid from a supply tank to a transfer tank and from said transfer tank to said fluid containment element; and
 - a drain element adapted to remove liquid from said fluid containment element to said transfer tank and from said transfer tank to a waste collection tank.
33. An apparatus according to claim 28 and further comprising:
- a pneumatic element adapted to transfer liquid from a supply tank to a transfer tank and from said transfer tank to said dip tank; and
 - a drain element adapted to remove liquid from said dip tank to said transfer tank and from said transfer tank to a waste collection tank.
34. An apparatus according to claim 30 and further comprising:
- a pneumatic element adapted to transfer liquid from a supply tank to a transfer tank and from said transfer tank to said dip tank; and
 - a drain element adapted to remove liquid from said dip tank to said transfer tank and from said transfer tank to a waste collection tank.
35. An apparatus according to claim 24, 25, 26 or 27 and further comprising a liquid recycle element adapted to provide recycled liquid.
36. An apparatus according to claim 30 and further comprising a liquid recycle element adapted to provide recycled liquid.

37. An apparatus according to claim 32 and further comprising a liquid recycle element adapted to provide recycled liquid.
38. An apparatus according to claim 24, 26 or 27 and further comprising a drawer assembly adapted to retract from said apparatus, wherein said drawer assembly comprises at least one slide rack.
39. An apparatus according to claim 28 and further comprising a drawer assembly adapted to retract from said apparatus, wherein said drawer assembly comprises at least one slide rack.
40. An apparatus according to claim 30 and further comprising a drawer assembly adapted to retract from said apparatus, wherein said drawer assembly comprises at least one slide rack.
41. An apparatus according to claim 32 and further comprising a drawer assembly adapted to retract from said apparatus, wherein said drawer assembly comprises at least one slide rack.
42. An apparatus according to claim 38 wherein said drawer assembly is adapted to cooperate with said fluid containment element.
43. An apparatus according to claim 42 wherein said drawer assembly comprises a plurality of said drawer assemblies, each adapted to cooperate with said dip tank, at least one transfer tank, a supply tank and at least one waste tank.
44. An apparatus according to claim 43 and further comprising a fluid transfer element configured to transfer fluid between said dip tank and said supply tank with said at least one transfer tank wherein said transfer tank comprises a pneumatic pressure control adapted to apply positive respective negative air pressure to said transfer tank.

45. An apparatus according to claim 38 wherein said a vertical slide positioner comprises a vertical slide positioner adapted to individually pivot said at least one slide in a vertical position.

5 46. An apparatus according to claim 43 wherein said a vertical slide positioner comprises a vertical slide positioner adapted to individually pivot said at least one slide in a vertical position.

47. An apparatus according to claim 44 wherein said a vertical slide positioner
10 comprises a vertical slide positioner adapted to individually pivot said at least one slide in a vertical position.

48. An apparatus according to claim 45 and further comprising a robotic element adapted to pivot said at least one slide in said at least one slide rack.

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